INDEX*

Abbreviations for *J. Neurophysiol.*, 92
Acetylcholine, chick embryos, 488
  in pupil, 271
  and synapses, 378, 390, 399, 440, 449, 468
    See also Synapse and synaptic transmission
Action potentials,
  cerebellar, 543
  cerebral cortex, 336
  cortex, See electroencephalogram
Acoustic area, cat, 308
Adaptation, visual, 228
Addition latent, 374
After-discharge, cerebral cortex, 349
After-potentials, 350
  acetylcholine and, 397
  axons, 361
  definition, 458
  excitability and, 363
  ganglia, 397
  positive, 368
  supernormal period, 367
  sympathetic ganglia, 397
Alpha rhythm in sleep, 51
Amylene hydrate, effect on EEG, 291, 304
Anesthesia, electroencephalogram and, 289
  spinal reflexes and, 81
Anions, EEG and, 163
Anoxia, reflexes and, 136
Anterior lobe of cerebellum, 33
Antidromic discharge, dorsal roots, 3, 515
Antidromic stimulation, 410
ARMSTRONG, H. S., and RIOCH, D. McK. Spinal pathways for nictitating membrane reflexes in the cat, 526
Asphyxia, spinal cord, 101
Audition, cat, 308
  receptors, 227
  sleep and, 500, 494
Auditory sense, 230
Axons,
  initiation of impulses in, 370
  polarization, 373
  potentials of, 361

Barbiturates, effect, on EEG, 112
  on spinal reflexes, 81
BEECHER, H. K., and McDONOUGH, F. K. Cortical action potentials during anesthesia, 289
BEECHER, H. K., McDONOUGH, F. K., and FORBES, A. Similarity of effects of barbiturate anesthesia and spinal transection, 81
Bioelectric currents, distribution of, 431
Birds, electroencephalogram and, 480
  general cortex in, 473, 476
BLAKE, HELEN, GERARD, R. W., and KLEITMAN, N. Factors influencing brain potentials during sleep, 48
BLAIR, H. A. Time constant of excitation and velocity in supernormal phase of nerve, 249
Blink reflex, 173
Blood flow, cerebral, 257
Blood sugar, effect on EEG, 148
Boutons terminaux, See synaptic knobs
BOYD, T. E., and MAASKE, C. A. Vagal inhibition of inspiration, and accompanying changes of respiratory rhythm, 533
BRADFORD, F. K. Ablations of frontal cortex in cats with special reference to enhancement of the scratch reflex, 192
Brain potentials, cat, 142
  See electroencephalogram,
  frog, 153
  man, 170
BREMER, F., and DOW, R. S. The acoustic area of the cerebral cortex in the cat. A combined oscillographic and cytoarchitectonic study, 308
—— DOW, R. S., and MORUZZI, G. Physiological analysis of the general cortex in reptiles and birds, 473
BRONK, D. W. Synaptic mechanisms in sympathetic ganglia, 380

Calcium, effect on EEG, 147, 162
CAMERON, D. E. See HOAGLAND, H. *et al.*, 170
CAMPBELL, E. See HOAGLAND, H. *et al.*, 276
Cell metabolism, electroencephalogram and, 170
Central excitatory state (*c.e.s.*), 416, 418
Central nervous system, recovery time, 227
Cerebellum, action potentials, 543
  afferent connections, 543
  epilepsy and, 266
  excitability of, 19
Cerebral circulation, 257
Cerebral cortex, acoustic area, 308
  action potentials, 337
  barbiturates and, 112
  chronaxie, 337
  EEG and sound, 494, 500
  electrical latency, 337
  excitability, 321
  extinction, 320
  facilitation, 320
  frontal lobes, 192

* EEG is used for electroencephalogram; CNS for central nervous system.

Cerebral cortex (Cont'd.)
hypothalamus and, 276
inhibition, 320
knee-jerk, 347
oestrus and, 10
parameter of stimulation, 339
pH of, 335
potentials, See electroencephalogram
rectum, 356
secondary facilitation, 320
sensation and, 112
slow voltage drifts, 331
temperature changes in, 42
threshold, 337
Cervical sympathetic, pupil, 271
Chicken embryo, acetylcholine, 488
Chloralosane, effect on EEG, 291, 304
Chloroform, effect on EEG, 291, 304
Chronaxie, cerebral cortex, 337
CNS, 227
nerve, 249
sensory nerves, 178
CIPRIANI, A. See PENFIELD, W. *et al.*, 257
CLARK, G., MAGOUN, H. W., and RANSON, S. W. Hypothalamic regulation of body temperature, 61
—— MAGOUN, H. W., and RANSON, S. W. Temperature regulation in cats with thalamic lesions, 202
CLARK, S. L. Responses following electrical stimulation of the cerebellar cortex in the normal cat, 19
COBB, S. See SCHWAB, R. S., 36
Cocaine block, 447
Conditioned reflexes, blink, 173
Convulsions, epileptiform, 257
metrazol, 271
Critical thermal increment, EEG, 159
CROCKER, E. S. See DUNCAN, D., 3
Cyclopropane, effect on EEG, 291, 304
Cytoarchitecture, acoustic area, 308

DAVIS, H., DAVIS, P. A., LOOMIS, A. L., HARVEY, E. N., and HOBART, G. A search for changes in direct-current potentials of the head during sleep, 129
—— DAVIS, P. A., LOOMIS, A. L., HARVEY, E. N., and HOBART, G. Electrical reactions of the human brain to auditory stimulation during sleep, 500
DAVIS, P. A. Effects of acoustic stimuli on the waking human brain, 494
—— See DAVIS, H., *et al.*, 129, 500
Delayed response, 218
DEMPSEY, E. W., and RIOCH, D. McK. The localization in the brain stem of the oestrous responses of the female guinea pig, 9
Detonator, discharge, 422, 448, 468
negativity, 449
Dilatation, pupillary, 268
Dinitrophenol, electroencephalogram and, 170
Direct current potentials, 129
Divinyl ether, effect on EEG, 291, 304
Dorsal nerve roots, 3, 515
DOW, R. S. Cerebellar action potentials in response to stimulation of various afferent connections, 543
—— See BREMER, F., 308
—— See BREMER, F., *et al.*, 473
DUBNER, H. H., and GERARD, R. W. Factors controlling brain potentials in the cat, 142
DUNCAN, D., and CROCKER, E. S. Aberrant ganglion cells as a source of intact fibers in severed dorsal roots, 3
DUSSER de BARENNE, J. G., and MCCULLOCH, W. S. Factors for facilitation and extinction in the central nervous system, 319

Ectosylvian gyrus, 309
Electroencephalogram (EEG)
acoustic stimuli and, 494, 500
anesthesia, 289
anions, 163
birds, 480
blood sugar, 148
calcium and, 147, 162
cat, 142
cell metabolism, 170
cerebellar, 543
critical thermal increment, 159
dinitrophenol, 170
frog, 153
H-ion, 147, 160
hypoglycemia, 276
hypothalamus, 276
hypoxia, 148
K-complex, 501
lactate ion, 148
magnesium, 162
nembutal, 276
osmotic pressure, 161
paralysis agitans, 36
potassium, 145, 162
sleep, 48
sodium, 161
sound stimuli, 494, 508
strychnine, 148
temperature and, 157
turtles, 481
Electromyograms, paralysis agitans, 36
ELSBERG, C. A., and SPOTNITZ, H. Relation of simulation time of receptors to recovery time in the nervous system: Visual, olfactory, and auditory senses, 227
Embryonic development, acetylcholine and, 488

Epilepsy, blood flow and, 257
cerebellum and, 266
ERLANGER, J. The initiation of impulses in axons, 370
Eserine, effect on reflexes, 566
Ether, effect on EEG, 291, 304
effect on spinal reflexes, 81
Ethyl alcohol, effect on EEG, 291, 304
Ethyl chloride, effect on EEG, 291, 304
Ethyl urethane, effect on EEG, 291, 304
Ethylene, effect on EEG, 291, 304
Evipal anesthesia, 85
effect on EEG, 291, 304
Excitability,
after-potentials and, 363
axons, 370
cerebral cortex, 322
retinal, 556
Excitation, nerve, 249
Excitation time, nerve, 249
Extinction, definition of, 319, 320
electrical responses during, 326
excitability and, 326
latency, 337
pH and, 335, 351
parameter of stimulation, 339
threshold, 337
Eye, parasympathetic and, 140
reflexes of, 136

Face, sensation, 241
Facilitation and *c.e.s.*, 416
chemical change, 420
definition, 319
electrical responses, 326
excitability and, 326
extracellular agents, 419
knee-jerk, 348
latency, 337
parameters of stimulation, 339
pH and, 334, 351
refractory period and, 419
retroactive, 178
secondary, 320
train of impulses, 445
threshold, 337
Wedensky, 442
Fatigue, CNS, 227
FAZEKAS, J. F. See HOAGLAND, H. *et al.*, 276
Fiber diameter, Vth nerve, 235
Fifth nerve. See trigeminal
FINAN, J. L. Effects of frontal lobe lesions on temporally organized behavior in monkeys, 208
Focal seizures, blood flow and, 257
FORBES, A. Problems of synaptic function, 465
—— and MORISON, B. R. Cortical response to sensory stimulation under deep barbiturate narcosis, 112
—— See BEECHER, H. K., *et al.*, 81
Frontal lobes, behavior, 208
memory and, 222
scratch reflex and, 192

Ganglia, dorsal root, 3
sympathetic, transmission in, 380
GASSER, H. S. Axons as examples of nervous tissue, 361
GELLHORN, E. See URY, B., 136, 268
General cortex, reptiles, birds, 473
GERARD, R. W. See BLAKE, H., *et al.*, 48
See DUBNER, H. H., 142
See LIBET, B., 153
GRANIT, R., and HELME, T. Changes in retinal excitability due to polarization and some observations on the relation between the processes in retina and nerve, 556
Gyri, ectosylvian, 309
suprasylvian, 309
Sylvian, 309

HADIDIAN, Z. See HOAGLAND, H., *et al.*,276
VAN HARREVELD, A., and MARMONT, G. The course of recovery of the spinal cord from asphyxia, 101
HARVEY, E. N. See DAVIS, H., *et al.*, 129, 500
Heat regulation, 61
thalamus and, 202
HELME, T. See GRANIT, R., 556
HIMWICH, H. E. See HOAGLAND, H., *et al.*, 276
H-ion, electroencephalogram and, 147, 160
HOAGLAND, H., HIMWICH, H. E., CAMPBELL, E., FAZEKAS, J. F., and HADIDIAN, Z. Effects of hypoglycemia and pentobarbital sodium on electrical activity of cerebral cortex and hypothalamus (dogs), 276
—— RUBIN, M. A., and CAMERON, D. E. Brain wave frequencies and cellular metabolism. Effects of dinitrophenol, 170
HOBART, G. See DAVIS, H., *et al.*, 129, 500
Humoral transmission, 378
pupil, 271
Hyperthermia, mechanism of, 78
Hypoglycemia, electroencephalogram, 276
Hypothalamus, cortex and, 276
EEG and, 276
electrical responses, 276
heat regulation, 206
oestrus and, 11
rectum, 356
sleep and, 42
temperature changes in, 42
thermal regulation, 61

Inhibition, cerebral cortex, 320
definition of, 320
knee-jerk, 347
parasympathetic, 274
pupillary reflexes, 136, 140
reciprocal, 352
Wedensky type, 443
Intermediary potentials, spinal cord, 350
Interneurons, bombardment of, 427
definition of, 402
potentials, 436
Internuncials. See interneurons
Iron wire model (Lillie), 441

Journal abbreviations, 93

K-complex, EEG, 501
KLEITMAN, N. See BLAKE, H., *et al.*, 48
Knee-jerk, cerebral cortex, 347
facilitation, 348
inhibition, 347
Koniocortex, 308
KUO, Z. Y. Studies in the physiology of the embryonic nervous system: IV. Development of acetylcholine in the chick embryo, 488

Lactate ion, electroencephalogram and, 148
LANGWORTHY, O. R., and ROSENBERG, S. J. Control by the central nervous system of the rectal smooth muscle, 356
Latency, cerebral cortex, 337
Latent addition, 374
LAWSON, H. See MERLIS, J. K., 566
LIBET, B., and GERARD, R. W. Control of the potential rhythm of the isolated frog brain, 153
Local excitatory process, 372, 467
LOOMIS, A. L. See DAVIS, H., *et al.*, 129, 500
LORENTE DE NÓ, R. Transmission of impulses through cranial motor nuclei, 402

MAASKE, C. A. See BOYD, T. E., 533
Macaca mulatta, cortical excitability, 320
epilepsy in, 257
frontal lobes, 208
MCCULLOCH, W. S. See DUSSER de BARENNE, J. G., 319
MCDONOUGH, F. K. See BEECHER, H. K., *et al.*, 81, 289
Magnesium, electroencephalogram and, 162
MAGOUN, H. W. See CLARK, G., *et al.*, 61, 202
Mammillary bodies, heat regulation, 206
Manuscripts, preparation of, 89, 95
MARMONT, G. See van HARREVELD, A., 101
MARTINO, G. The conditioned reflex of blinking, 173
Medial geniculate body, 309
Medullary tractotomy (Sjöqvist), 239
Membrane theory, 351, 441
Memory, frontal lobes and, 222
MERLIS, J. K., and LAWSON, H. The effect of eserine on spinal reflexes in the dog, 566
Mesencephalon, oestrus and, 13
Metabolism, EEG and, 170
Metrazol, convulsions, cats, 271
Minimum identifiable odor, 227
MORISON, B. R. See FORBES, A., 112
MORUZZI, G. See BREMER, F., *et al.*, 473
Motoneurons, recovery cycle, 412
rhythm of discharge, 412
Motor cortex, epilepsy and, 265

Negative after-potential. See residual negativity
Nembutal, effect on EEG, 276, 291, 304
sensory, chronaxie of, 178
Nerve, supernormal fibers, 249
Nictitating membrane, 526
Nitrous oxide, effect on EEG, 291, 304

Oculomotor potentials, 432
Oculomotor preparation, 407
Oestrus, CNS and, 9
cerebral cortex and, 10
Olfaction, 227
Osmotic pressure, electroencephalogram and, 159

Paraldehyde, effect on EEG, 291, 304
Paralysis agitans, EEG, 36
Parasympathetic system, pupil, 273
Parietal lobe, localization in, 122
Parkinsonism, EEG in, 36
PENFIELD, W., van SÁNTHA, K., and CIPRIANI, A. Cerebral blood flow during induced epileptiform seizures in animals and man, 257
pH, cerebral cortex, 335, 351
Physostigmine. See eserine
PIÉRON, H., and SEGAL, J. Sur un phénomene de facilitation rétroactive dans l'éxcitation électrique de branches nerveuses cutanées (sensibilité tactile), 178
Polarization, axons, 373
retina, 556
Positive after-potential. See after-potential
Postcathodal depression, 374
Posterior roots, efferent discharge, 515
Posture, cerebellum and, 21
Potassium, effect on EEG, 145, 162
PREFATORY NOTE, 1
Pupillary reflexes, 268, 526
Pupils, reflexes of, 136

RANSON, S. W. See CLARK, G., *et al.*, 61, 202
Receptors, auditory, 227
  chronaxie, 227
  olfactory, 227
  recovery time, 227
  retinal, 550
  visual, 227
Reciprocal innervation, 352
Recovery cycle, CNS, 412
Recovery time, CNS, 227
Rectum, CNS and, 356
  smooth muscle of, 356
References, form of, 91
Reflex reversal, 405
Reflexes, anoxia and, 136
  barbiturates and, 81
  blink, 173
  conditioned, 173
  efferent pathways, 515
  eserine and, 566
  eye
  nictitating membrane, 526
  pupillary, 136, 268, 526
  scratch, 192
  spinal, asphyxia and, 101
  spinal paths, 526
  temperature effects, 515
Relatively refractory period, neurons, 413
Reptiles, general cortex of, 473, 476
Residual negativity, 450
  See also after-potentials
Residual positivity, 455
  See also positive after-potentials and slow voltage drifts
Respiratory center, 533
Retina, excitability, 556
Reverberations, 429
Reverberating circuits, cerebral, 277
RIOCH, D. MCK. See ARMSTRONG, S. H., 526
  See DEMPSEY, E. W., 9
ROSENBERG, S. J. See LANGWORTHY, O. R., 356
RUBIN, M. A. See HOAGLAND, H., *et al* , 170

von SÁNTHA, K. See PENFIELD, W., *et al.*, 257
SCHWAB, R. S., and COBB, S. Simultaneous electromyograms and electroencephalograms in paralysis agitans, 36
Sciatic nerve, stimulation of, 136
Scratch reflex, frontal lobes and, 192
SEGAL, J. See PIÉRON, H., 178
Sensation cerebral cortex and, 112
  tactile, 178
Sensibility, facial, 241
SEROTA, H. M. Temperature changes in the cortex and hypothalamus during sleep, 42
Sexual behavior, guinea pig, 9
Shuttle box, 212
Silent period, 438
Sleep, brain temperature and, 42
  direct current potentials in, 192
  EEG and, 48, 494, 500
  normal, 49
  stages of, 503
  theory of, 58
Slow voltage drifts, cortex, 331
Smooth muscle, CNS and, 356
Sodium barbital, effect on EEG, 291, 304
Sodium, electroencephalogram and, 161
Spatial summation, axons, 376
Spinal animal, 81, 101, 566
Spinal cord, electrical reactions, 436*n*
  internuncial activity, 407*n*
  oestrus and, 15
Spinal reflexes, 526
  eserine and, 566
Spinal tract, Vth nerve, 234
SPOTNITZ, H. See ELSBERG, C. A., 227
Stellate ganglion, synapses of, 382
Stimulation, thyratron, 258
Strychnine, electroencephalogram and, 148
  EEG, birds, 484
STYLE BOOK, 89
Subliminal stimulation, 421
Subthreshold stimulation, axons, 376
Summation, axons, 376
  CNS, 422
  spatial, 423
  temporal, 372, 426
Supernormal period, after potentials and, 367
  nerve, 250
  neurons, 367, 415
Suprasylvian gyrus, 309
Sylvian gyrus, 309
Sympathetic ganglia, CNS and, 402
  synaptic transmission in, 380
Sympathetic system, pupil and, 268
SYNAPSE, SYMPOSIUM ON, 361
Synapse and synaptic transmission, 380, 402
  absolutely refractory period, 410
  acetylcholine liberation 390, 440, 449, 468
  acetylcholine perfusion, 391, 397
  after-potentials and, 397, 458
  antidromic effects, 410
  calcium and, 393
  cranial motor nuclei, 402
  delay, 408
  detonator discharge, 422
  eserine, 566
  experimental conditions, 406
  facilitation, 416
  internuncial bombardment, 427, 431
  model of, 441
  oculomotor nucleus, 432
  oxygen, 394
  potassium and, 393
  recovery cycle, 412

Synapse, etc. (Cont'd)
reflex reversal, 405
relatively refractory period, 413
residual negativity, 451
spatial summation, 422
subliminal fringe, 405
subliminal stimulation, 421
sympathetic ganglia, 380, 466
acetylcholine liberation, 390, 467
acetylcholine perfusion, 391, 397
after-potentials and, 397
excitatory state, 384
impulse frequency, 381
oxygen and, 394
potassium and, 393
temporal summation, 422
theories of, 440, 456
variation, 409
Synaptic knobs, 403, 448
residual negativity of, 453

Tactile sensibility, 178
Temperature changes in brain, 42
coefficient, EEG, 158
effect on posterior root discharge, 515
electroencephalogram and, 157
Temporal discrimination, 217
organization of behavior, 208
summation, axons, 372, 422
Thalamus, thermal regulation, 202
Thermal regulation, 61
thalamus and, 202
Threshold, cerebral cortex, 337
Thyratron stimulation, 258, 320
TOENNIES, J. Conditioned impulses by reflex discharges over the dorsal roots, 515
Tractotomy (Sjöqvist), 239
Transmission, humoral theory, 378
Tribromethanol, effect on EEG, 291, 304
Trichlorethylene, effect on EEG, 291, 304
Trigeminal nerve, anatomy, 234
ophthalmic division, 235
spinal tract, 234
Turtles, electroencephalogram in, 481
general cortex, 480

URY, B., and GELLHORN, E. On the influence of anoxia on pupillary reflexes in the rabbit, 136
—— Rôle of the sympathetic system in reflex dilatation of pupil, 268

Vagal inhibition, 533
Velocity, nerve, 249, 254
Vermis, See cerebellum
Vision, receptors, 227
Voltage-capacity curve, nerve, 250
Voltage drifts, significance of, 350
Volume conductors, 431

WALKER, A. E. Anatomy, physiology and surgical considerations of the spinal tract of the trigeminal nerve, 234
Wedensky facilitation, 442

JOURNAL OF NEUROPHYSIOLOGY